

WHAT IS CLAIMED IS:

1                   1.       A method of identifying an intervention that mimics the effects of  
2 caloric restriction in cells, comprising:  
3                   obtaining a biological sample;  
4                   exposing said biological sample to an intervention;  
5                   waiting a specified period of time;  
6                   assessing changes in gene expression levels, levels of RNA, protein, or protein  
7 activity levels related to one or more biomarkers of aging; and  
8                   identifying said intervention as one that mimics the effects of caloric  
9 restriction if one or more changes in said levels also occurs in caloric restriction.

1                   2.       The method of claim 1, wherein said biological sample comprises  
2 cells.

1                   3.       The method of Claim 2, wherein said cells are obtained from a  
2 mammal.

1                   4.       The method of claim 3, wherein said mammal is a mouse.

1                   5.       The method of Claim 1, wherein said change in gene expression levels,  
2 levels of RNA, protein, or protein activity levels corresponds to a change in gene expression  
3 for a gene encoding a chaperone protein.

1                   6.       The method of Claim 5, wherein said gene encoding a chaperone  
2 protein is GRP78.

1                   7.       The method of Claim 1, wherein said biomarker is apoptosis.

1                   8.       The method of Claim 1, wherein said biomarker is aging.

1                   9.       The method of Claim 8, wherein said biomarker of aging is a  
2 production of cancer cells.

1                   10.      The method of Claim 1, wherein said changes in said gene expression  
2 level, levels of RNA, protein, or protein activity levels related to one or more biomarkers of  
3 aging occur in 6 weeks or less.



1                   22.     The method of Claim 24, wherein the reference animal has been on a  
2     calorie restricted diet for less than about 2 weeks.

1                   23.     The method of Claim 19, wherein said test animal is a mouse.

1                   24.     The method of Claim 19, wherein changes in gene expression are  
2     assessed in said test animal.

1                   25.     The method of claim 19 which further comprises:             :  
2                   obtaining a gene expression profile from a calorie restricted reference animal;  
3                   comparing changes in gene expression for the test animal to the gene  
4     expression profile of the calorie-restricted reference animal; and  
5                   identifying said intervention as one that mimics the effects of calorie  
6     restriction if the gene expression profile of the test animal is statistically similar to the gene  
7     expression profile of the calorie restricted animal.

1                   26.     The method of Claim 28, wherein the gene expression profile of the  
2     test animal is determined to be statistically similar to the gene expression of the calorie  
3     restricted animal by one way ANOVA followed by Fisher's test ( $P<0.05$ ).

1                   27.     A system for identifying an intervention that mimics the effects of  
2     calorie restriction in a test animal comprising a test animal and a gene chip comprising genes  
3     known to have altered expression during calorie restriction.

1                   28.     The system of claim 27, wherein the gene chip comprises genes  
2     selected from the group consisting of genes for immune system activation, genes for DNA  
3     repair, genes associated with apoptosis and genes for the enteric nervous system.